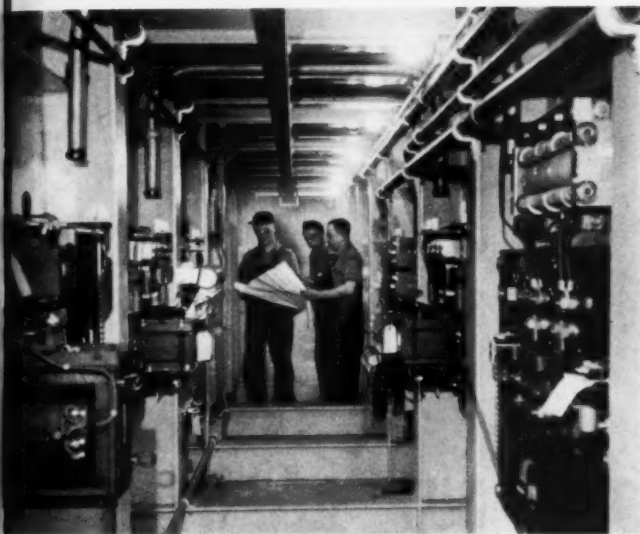


Midwest Engineer



Upper left: Interior of main girder of new overhead crane houses controls, power components.

Upper right: NIMAPC Project will map flood hazard areas.

Lower view: Welding 30 in. natural gas pipeline running from Troy Grove to La Grange, Ill.

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Page 12.

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May 1961

Vol. 13 No. 9



WHEN SPRING IS "BUSTING OUT" ALL OVER concrete pavement isn't... and taxpayers save money!

Detours—one sign of spring that costs you money! You won't find them where there's concrete!

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 even if carved from solid rock!**

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MIDWEST ENGINEER

ISPE Bureau Will Offer Public Engineering Aid

The Illinois Society of Professional Engineers has founded a Professional Engineering Aid and Referral Bureau. Its purpose is to aid the public to obtain competent engineering service. The Bureau's service is available to individuals, civic bodies, governmental agencies, institutions, and manufacturing concerns. Operating, not unlike a clinic at medical school or hospital, nominal fee service is given to those who cannot pay full professional engineering fees. For those individuals and groups who do not need to rely on charity and be subjected to delays and investigations associated with such service, an appointment may be arranged for an interview, at which time a cursory free study is made of the problem, to determine which field of engineering is involved. Then, if the inquirer is interested and desires to proceed, a list of professional engineers is made available to him, and he can make his own

arrangements with the engineer of his choice.

Any Western Society member who wishes to be listed by this Bureau should contact Mr. Howard A. Carter or Mr. Rudolph A. Wolfson, WH 2-0853.

New Edison Generators To Cost \$22 Million

Commonwealth Edison company has placed a \$22,050,000 order with Westinghouse Electric corporation for two big turbine generators with a total output capacity sufficient for the electrical needs of a community of more than 1 million persons.

Each generator will have a net output capacity of 560,000 kilowatts. One is for service at the utility's Joliet station early in 1965 and the other for use in 1965 or 1966 at a location not yet determined.

The company also announced that a new 305,000 kilowatt unit has been placed in regular service at its Crawford station in Chicago.

RECORD-BREAKING CONSTRUCTION IN THE CENTRAL AREA

Chicago's Central Area today is in the midst of a half-billion-dollar construction boom.

The Mayor's Plan for Development of the Central Area was announced in 1958, but as the figures show, construction in the Area has been the result of the efforts of private interests and of businessmen who have chosen to lead the drive for improvement and revitalization. This is a concrete demonstration of private enterprise's confidence in the Central Area.

Since 1958, cost of new construction in the Central Area (from the Chicago River on the north and west to Roosevelt Road on the south and Lake Michigan on the east) has totaled more than \$247,860,000. This includes only those buildings completed in the past three years or now under construction. The total

does not include the millions spent in remodeling existing structures.

One way to put into perspective the figure of \$247,860,000 is to compare it with the cost of rebuilding the entire city of Chicago from the time of the Great Fire, October 8, 1871, until January 1, 1890—a total of \$257,215,779.

The new space created since 1958 amounts to almost six and one-half million square feet. In addition, there are 896 new housing units and 656 new hotel and motel rooms.

It should be pointed out, too, that the cost of the present Central Area building boom, like the cost of reconstruction after the fire, is being borne largely by private interests with only a fraction of the needed funds coming from governmental agencies.

Calendar of Chicago Engineering

—MAY 17, WED., Noon Luncheon Meeting, 12:00 noon. At WSE Hq.

—MAY 23, TUES., Annual Meeting, Installation of Officers and Ladies Night. Social Hour 5:15 p.m. Dinner, 6:30. Entertainment about 8:00. At WSE Hq.

—MAY 24, WED., Noon Luncheon Meeting, 12:00 noon. At WSE Hq.

—MAY 31, WED., Noon Luncheon Meeting, 12:00 noon. At WSE Hq.

—JUNE 7, WED., Noon Luncheon Meeting, 12:00 noon. At WSE Hq.

Chicago Area Industrial Districts

THE industrial district, or industrial park, is almost as common on the American scene as the drive-in movie. Ready acceptance of this relatively new emphasis in industrial location manifests the desire of industry to have its own community. However, it is only the emphasis, and not the industrial district, that is new.

"The planned industrial sub-division is a logical response to current trends in industrial location. It is well adapted to the continuing decentralization of industrial operations, the increasing use of horizontal-line production methods best housed in land-consuming, one-story plants, and the emphasis on esthetics in plant design. It recognizes the scarcity and high cost of in-town sites and the space requirements for future plant expansion, off-street loading docks, and employee parking."

Among the attractions of an industrial district is its readiness for the immediate installation of a plant with all services and facilities provided. In an industrial district, industry rates first consideration, and nuisance complaints are rare or non-existent.

Criteria For Districts

The criteria for industrial districts in Metropolitan Chicago, adopted by the Industrial Development Division of the

Chicago Association of Commerce and Industry, are as follows:

1) An industrial district shall be a single tract of land which has been, or is being, developed according to a comprehensive plan with adequate control being maintained by the developers, and zoning, so as to maintain and protect the investment of industry occupying sites thereon.

2) An industrial district will provide for a "community" of industries, rather than for a single industry. (Considering the many advantages available in an organized industrial district, there still remains a need for tracts of properly-zoned land, other than districts, to accommodate single manufacturing operations. An example is found in the huge Automatic Electric Company plant, located on a 145-acre site in Northlake, Illinois. While this site size could be made available in some industrial district, the dollar investment in the plant justifies the cost of providing, independently, the many services necessary for its operation.)

3) An industrial district will have in service, or immediately available, the following facilities: electricity; gas; paved streets; water supply; and sewage disposal. Railroad facilities are highly desirable and the site must not present a serious drainage problem.

4) An industrial district will require the following: set-backs and landscaping; off-street parking and loading; control of design and construction; screening of outdoor storage; control of fumes, odors, smoke, noise and other nuisance factors; limitation of size and number of signs; and prohibition of other than industrial buildings except in those few cases where an extraneous building is used to serve district occupants.

5) An industrial district will be serviceable, with access to one or more forms of surface transportation.

Report prepared by Industrial Development Division—Chicago Association of Commerce and Industry includes tabulations show-costs, requirements, facilities of 58 districts.

6) An industrial district will conform to all federal, state, county, township and municipal laws and codes applicable, and shall be able to provide in writing a complete list of all restrictions, covenants, and zoning laws in effect in the district.

Obviously, these criteria leave room for differences between districts. This is the case in Metropolitan Chicago since there is considerable individuality among the districts. The purpose of these criteria is not to produce, or attempt to produce, conformity, but rather to insure that a district is sufficiently sophisticated, or "mature," to warrant the serious consideration of industry.

The Chicago Association of Commerce and Industry has compiled data on industrial land developments. It covers information on numerous districts, particularly as to services, land costs, zoning and facilities.

(Summarized from report—"Chicago Area Industrial Districts"—by Charles F. Willson, Director—Industrial Development Division—and Robert W. Latta, Industrial Development Representative—Chicago Association of Commerce and Industry.)

(Report was originally published in Commerce—Jan. 1961)

STUDY SHOWS GROWTH IN POLYETHYLENE USE FOR HIGHWAYS AND RUNWAYS

Polyethylene is becoming an increasingly important factor in the construction of American highways and airport runways, according to a study just completed by U. S. Industrial Chemicals Co.

The study shows that highway and runway contractors are using more polyethylene in its established construction applications and at the same time developing significant new uses.

Sheeting Aids Curing

Currently the most important use of polyethylene in highway and runway construction is as a cover during the critical concrete curing period. Poly-

ethylene sheeting has earned highest rating as a guard against the too-rapid evaporation during curing that can result in concrete cracks and deterioration. Its water barrier properties, its flexibility, lightness, and re-usability make it exceptionally efficient as a curing cover.

Slabs Kept Moist

A recent report by the New York State Department of Public Works, stated that 4-mil white opaque polyethylene sheeting kept concrete slab surface uniformly moist throughout the curing

period; handled easily and could be re-used repeatedly; and did not detract from concrete compressive strength.

Tape Protects Joints

Polyethylene tape is also playing a significant, although newer, role in concrete curing for highway and runway construction in the United States. To protect sawed joints in rigid concrete pavements during curing, the Prestite Division of American-Marietta Company, St. Louis, Missouri, has developed a 2.5-inch-wide, .0045 mil polyethylene tape, on which are extruded two ribbons of adhesive mastic. Applied on either side of the joint, the tape completely covers it, preventing loss of moisture and infiltration of foreign matter.

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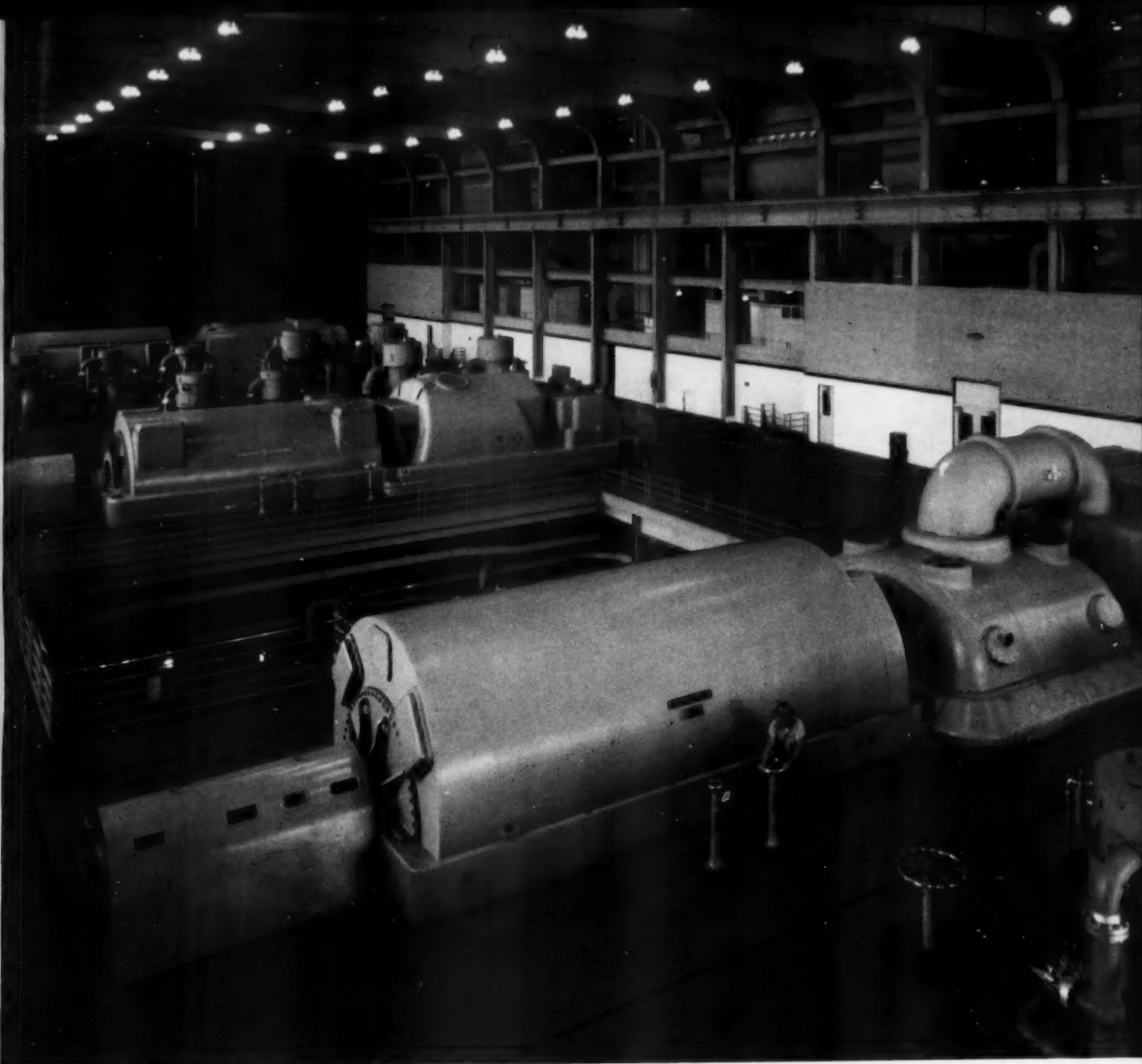
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1961



WALTER C. BECKJORD STATION THE CINCINNATI GAS & ELECTRIC COMPANY 618,000 kw—4 Units

Power in Ohio...

Cincinnati and its surroundings are powered by The Cincinnati Gas & Electric Company. Its Beckjord facility, where four units are now in service and a 225,000 kw Unit 5 will be completed in the latter part of 1963, is unique among power stations.

The plant is designed for river level fluctuations of some 70 feet and because it is inaccessible to railroad facilities, equipment and fuel are delivered by barge.

Its landscaping and appearance testify to the company's civic pride. The Cincinnati Gas & Electric Company serves nine counties and over 1,300,000 people.



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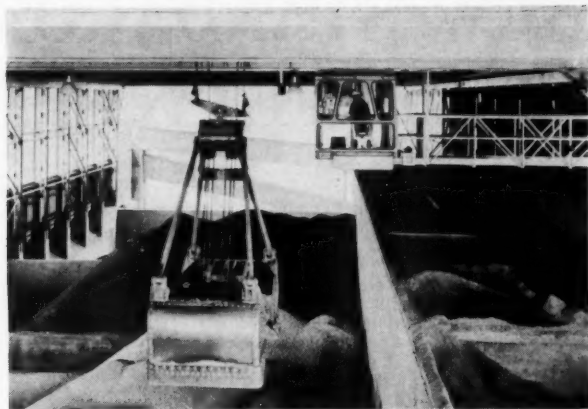
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OVERHEAD CRANE INNOVATIONS



Radical design changes provide:

Pressurized passageway inside main girder

Electronic stepless bucket control

Electric hoist inside girder

Precedent breaking changes in design of overhead cranes are incorporated in new models just announced by Harnischfeger Corp., Milwaukee, Wis. These are made possible by improved electronic components and a pressurized "walk-in" passageway which, in itself, has made the entire concept feasible.

The first two units recently were installed at a large cement plant in Kansas.

On the surface, the most obvious change in the new walk-in crane is that the interior of the main girder is utilized as a well-lighted corridor in which are located strategic controls and power components, and inside which maintenance crews can conveniently work.

Interior aisles of the two Kansas cranes are 8 ft. high, 5 ft. wide, and extend almost the full length of the 120-ft. girders.

The hollow-beam feature (borrowed from a European development) provides in itself a certain degree of protection for the electronic controls and other components. However, each aisle or passageway is pressurized similar to the cabin of an airliner. So is operator's cab.

This pressurization is accomplished by a relatively small but powerful blower which forces air continually into the girder, after screening it through wool-bag filters. A pressure of about 2 lbs.

above outside atmospheric pressure is maintained.

In addition to coping with high concentrations of abrasive dust at cement mills, this same pressurized walk-in arrangement will be equally valuable in steel mills, copper smelters, bulk chemical plants where corrosive or abrasive atmospheres are encountered.

Pressurizing Needed

An ingenious touch is in the form of a small but heavy-capacity P&H electric hoist suspended from an I-beam "track" which runs the full length of the ceiling inside the girder. It is used for handling of equipment inside the girder, or to elevate tools through a dust-proof hatch from the main floor below.

Half the economy of the new design is a result of being able to eliminate "auxiliary gingerbread."

As an example: It previously was necessary for wheels at each end of the girder to be propelled from a large centralized electric motor—power to each wheel being provided through long cross-shafts with their necessary multiplicity of couplings and bearings. With the new walk-in design, however, four smaller individual motors can be spotted at the four corners and geared directly to the wheels—thus completely eliminating the long cross-shafts as well as most of the other mechanical linkage. On the other hand, that the cross-shaft arrangement still is considered completely practical for shorter-span cranes.

The "grab-bucket" which handles the bulk material is clamshell in design and thus more complex in operation than simply lowering a hook and raising it again. The clamshell must be opened, lowered into the material, closed, then raised again.

Grab bucket weighs about 5 tons on this radically new overhead traveling crane. It is one of two recently installed in Kansas cement plant.

By using variations of "electronic stepless control" (everything except the bucket hoists being AC powered), all eight motions of the crane and its bucket are governed by only two "joy stick" levers instead of the conventional four.

It is explained that most cranes are seldom called upon to make more than one or two full-capacity lifts during their routine daily operations—full capacity lifts being the exception rather than the rule. Also the operation of most cranes is usually intermittent with at least a percentage of "rest" time.

But these first two walk-in cranes, with rated capacities of 15 tons each, are required to make 15-ton lifts on an average of every 53 seconds—straight through two shifts for 16 hours per day. (Editor: Capacities include weight of bucket, which here is roughly five tons.)

The total amount of material handled is reported to be 540 tons per hour per crane.

"Tables and Formulae"

"Tables and Formulae" has been prepared by Automatic Electric, subsidiary of General Telephone & Electronics Corp. This booklet, the fourth of a series, shares a common goal with its predecessors "Relay Terms," "Basic Circuits" (telephony), and "Conversion Factors."

"Tables and Formulae," (32 pages) contains tables of weights and measures, math symbols and constants, the Greek alphabet, temperature conversions, binary numbers, powers of numbers, electrical formulae, the fundamentals of Boolean algebra, and much more information useful to the scientist and engineer. For your copy, write Director, Control Equipment Sales, Industrial Products Division, Automatic Electric Sales, Northlake, Illinois.

NEW STANDARDS NEEDED FOR SAFETY CLOTHING

Charles W. Wyman is a senior staff engineer at Western Electric. He was graduated from Southwest Missouri State College in 1926, and joined the company's staff as a chemical engineer the same year. Mr. Wyman has been industrial hygienist and safety engineer at the Hawthorne Works in Chicago since 1939. He is a member of the American Industrial Hygiene Association and past president of the Chicago chapter. Mr. Wyman is a member of the Western Society of Engineers and the ASA's Safety Standards Board.

Places of employment must be made safe for the worker by the application of good engineering practices and safety standards. Personal protective equipment should never be considered a substitute for good engineering, intelligent supervision, and a careful worker!

Such items as gloves, aprons, special clothing and protective footwear are only a secondary line of defense against minor hazards impractical to control by other means.

When such equipment is needed to protect the employee, a safety-conscious employer furnishes it without charge.

Supervision must take the responsibility of seeing the necessary items are properly fitted and worn . . . as well as

Selection plus supervision as to fit and conscientious wear by workers essential

maintained and replaced when necessary.

From the viewpoint of the employee and the employer, protective equipment best suited for any job should:

1. Give the needed protection and be the most comfortable to wear.
2. Offer minimum interference with motion and dexterity.
3. Afford the longest wear compatible with cost.
4. Be the easiest to dispense, maintain, and salvage.

Many authorities agree that present standards for protective clothing leave much to be desired. Most of them are American War Standards originated during 1944 and 1945, when it was necessary to conserve strategic and critical materials.

During the past 15 years, better materials have been developed and improvements made in design and construction which make these old standards of questionable value. When equipment is pur-

by Charles W. Wyman

chased without benefit of standards or specifications, price can become the prime consideration. If the manufacturer should compromise on design, quality of materials or workmanship to reduce his cost, then price items can prove expensive.

Adequate standards for personal protective equipment and clothing will come only when safety engineers and purchasing agents fully appreciate the need for them.

At Western Electric, it is normal practice to obtain the approval of safety engineers to the conclusion of any purchase commitment for protective equipment and clothing to assure that adequate quality is maintained as the primary consideration in the selection of safety products.

(Reprinted from National Safety News for March, 1961)

J-M Offers A New Pre-Fab Exterior-Interior Panel

Johns Manville Corporation has developed a new type of prefab wall panel. It provides a new system of construction. Announcement was made at the company's recent annual meeting.

Basic ingredients of the system, according to President Clinton B. Burnett, are two new products—a prefabricated modular panel and a new adhesive joint compound.

For years, Burnett said, the building industry has sought a prefabricated exterior-interior sandwich panel that would meet all building codes and still slash building costs. He added that lack of a satisfactory method of joining the panels has proved a major stumbling block. J-M's new adhesive system, he said, will do the job.

The new panels provide wall surfaces ready for final finishing and are complete with vapor barrier and insulation. The panels utilize a new board product and a new adhesive joint compound.

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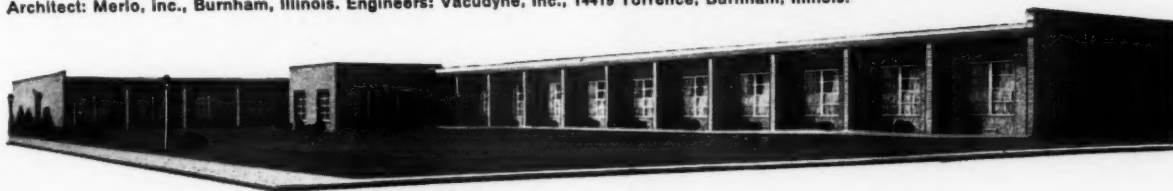
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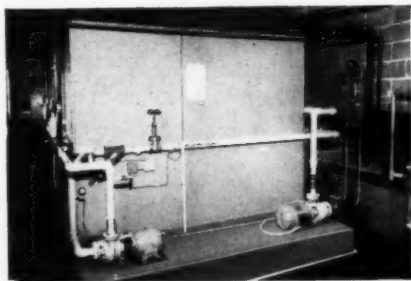
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The Homestead Convalescent Home in Burnham is heated and cooled entirely by gas. Homestead, which contains 19,000 square feet with facilities for 105 beds, plus dining, recreation and therapeutic facilities. Architect: Merlo, Inc., Burnham, Illinois. Engineers: Vacudyne, Inc., 14419 Torrance, Burnham, Illinois.



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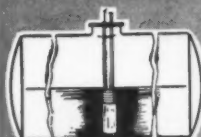
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"Get Acquainted" Dinner For New Members



New members "Get Acquainted" meeting was held on the evening of April 10th. A partial view of the fine "turnout" attracted is seen in the picture above. The affair was highly successful in achieving its objective—providing an opportunity for those joining WSE in recent months to become better acquainted with fellow members new and old.

Lauren R. Asplund, chairman of the membership committee, presided and introduced WSE president Raymond D. Maxson. Mr. Maxson's remarks are reported on the facing page.



The guest speaker at the dinner was Oliver Field (above, left). Mr. Field, Director of the Bureau of Investigation of the American Medical Association gave a talk entitled "Medical Quackery." He was introduced by Thomas E. Zinkus, assistant engineer, Illinois Bell Telephone Co. and chairman of the "Get Acquainted" dinner.

Mr. Field discussed many aspects of "medical

May, 1961

quackery" telling of his own experiences and that of the Bureau over a period of years. He described an amazing variety of nostrums and appliances claiming remarkable curative powers and brought with him an interesting selection of exhibits. He also traced legislation introduced over past years to combat quackery and the role of the AMA in such efforts.

What It Means To Be A Member of WSE

The meaning of membership in the Western Society of Engineers—the benefits of its activities—the satisfaction of association with fellow members—the rewarding opportunities for those willing to serve—were all highlighted in remarks



Frank M. Scott, 2nd vice president, left, and Raymond D. Maxson, president at the Speaker's Table of new member's dinner.

addressed to new members at the "Get Acquainted" dinner by Raymond D. Maxson, president.

Mr. Maxson emphasized the broad scope of WSE in its inclusion of all branches of the profession within its membership. He also traced some of the outstanding accomplishments of WSE since its inception 92 years ago. It was then that a group of engineers met in the office of Col. Roswell B. Mason, engineer and one time mayor of Chicago, to organize the Society.

Further Mr. Maxson emphasized how The Western Society fulfills fundamental needs by encouraging the advancement of the interests of the profession, the education of members, the interests of the community and the interest of the employer.

Special mention was made of the sustained efforts of WSE to aid young engi-

neers in adjusting to new responsibilities and in development of their careers. An important part of this effort is the Young Engineers Forum, providing opportunity for young engineers to meet together and with older men prominent in the profession.

Continuing, Mr. Maxson called attention to the splendid programs offered at both the General Meetings and noon luncheons featuring outstanding speakers on subjects of general as well as technical interest.

Among those present who have become members during the past twelve months are the following:

Leonard Alfredson, John A. Anderson, Oscar A. Anderson, Robert Baken, Ralph A. Barrows, Richard F. Beattie, J. R. Berendes, Basil L. Burrell, W. A. Chittenden, J. Wilson Cook, G. S. Gralewski, P. J. Griesbach, Q. Halbeisen, E. J. Jedlicka, R. A. Johnson, George F. Jones, J. J. Kennedy, R. E. Kiesel, Howard R. Levin, C. A. Martin, R. K. Metcalf, G. J. Moorwessel, L. K. Mulholland, J. Ronald Murray, W. D. Olson, R. H. Petersen, Jr., B. F. Przybycin, Tapas K. Roy, S. A. Schack, R. W. Schalk, John W. Taylor, Chester M. Wiig, and W. T. Wishart.

Announce Programs for Initial Fall Meetings

The Kick-off Dinner Meeting for the 1961-62 technical session will be Tuesday evening, October 3, 1961. Mr. A. C. Peed, Supervisor of Industrial and Scientific Publication, Sales Service Division of the Eastman Kodak Company, Rochester, New York, will speak on the subject "PHOTOGRAPHY IN SCIENCE AND INDUSTRY."

Mr. Fahey Flynn, popular commenta-

PLASTIC TANK WHEELS recently developed by Firestone Tire & Rubber Company achieve great reduction in weight. A recent demonstration was the ease with which an 8 year old boy lifted one of the new wheels.

Steel Mills produce less ammonium sulphate as over-all operations still lag well behind a year ago. This steel industry by-product is a major source of nitrogen for fertilizer. Steel makers for the past year have kept their price firm at \$35 a ton, but there's a good chance of a boost soon.

tor on WBBM will be the "Dinner Speaker" for the first scheduled general meeting, Tuesday evening, October 28, 1961.

Distilled Water Brochure Tells "Difference"

"There is a Difference—in Distilled Water" is the title of an interesting informative little four-page brochure just released by Hinckley and Schmitt, The Water Company. To illustrate the "difference" excellent use is made of a Residue Evaporation Test and Mineral Analysis Tests. The "Ask Us Hinckley & Schmitt, Distilled Water Consulting Service" is also described. Tank truck bulk delivery, 50-gal. drum or 5-gal. bottle service is available. For your copy of "There is a Difference" write Hinckley & Schmitt, 420 West Ontario St., Chicago 11, Ill.

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FLOOD HAZARD MAPPING

For the Northeastern Illinois Metropolitan Area

by John R. Sheaffer

Our rivers and waterways have periodically spilled from their channels and have inundated the adjacent low lands or flood plains. Such overflows did not become problems, except possibly to navigation, until development of the flood plains gave the floods something to damage. It is conceivable that if adequate land-use planning in conjunction with regulatory and flood-proofing measures had guided this development there would be little, if any, flood damage today and no major flood problems would exist. Because such planning was not exercised, however, we who live in Northeastern Illinois have inherited serious flood problems. Flood events are rightly considered as natural phenomena or "acts of God," but the damages which accrue result from development within flood hazard areas. Although this concept is well known among flood experts, there is a continued persistence by land developers to subdivide flood plains without giving consideration to the risk involved. Unregulated development of these areas will of necessity result in even greater future flood losses.

Experience suggests to obtain a reasonable degree of flood protection in the face of increasing development of flood plains, there is a need to regulate land use to avoid the creation of unnecessary new flood problems. Informed of this situation by the Northeastern Illinois Metropolitan Area Planning Commission, the General Assembly of Illinois has granted new zoning and regulatory powers to municipalities so as to enable them to plan for flood damage reduction and thereby provide for the maximum economic use of their flood plains.

Flood Mapping Program

A need has thus developed for flood information which would enable municipalities to enact reasonable flood-plain regulations.

Now, NIMAPC is undertaking a cooperative venture with the U.S. Geological Survey

for the mapping the areal extent of the flood hazard in much of the metropolitan area. Superimposed upon the standard 7½" topographic map base will be a blue overlay to record the flood hazard in graphic form. The Survey made a sample flood hazard map for the Calumet City Quadrangle. This quadrangle was selected because of the extremely low relative relief. If the mapping were possible in this flat area, it was felt it would be feasible throughout much of the metropolitan area.

Scope of the Program

The areal extent of the mapping program will encompass forty 7½ minute quadrangles, or approximately 60 per cent of the metropolitan area. Five years will be required to complete the mapping with a tentative starting date of July 1, 1961. The publication of the results will occur intermittently during this period with all field work on all quadrangles to have been completed by June 30, 1966, and all quadrangles to be published as soon after as the Government Printing Office schedule will permit. Accompanying the map will be analytical and interpretative texts which will include for each waterway the following data: profiles of observed floods, flood frequency analyses and a record of overbank flows for selected gages to present a record of past flood experience. In order to supplement existing hydrologic data and thereby implement the mapping, the program will also involve the installation and operation of a network of crest stage gages and the preparation of an updated flood frequency analysis.

Program Costs

The cost of preparing the maps is estimated to be approximately \$5,000 per quadrangle making a total of \$200,000 if forty quadrangles are mapped. In addition, the costs involved in the installation and operation of the network

of crest stage gages, and in the preparation of the flood frequency analyses would amount to \$50,000, thus making a total program cost of \$250,000. The U.S. Geological Survey will provide 50 per cent of the costs of this program with the remainder, \$125,000, being supplied by local sources. The NIMAPC has been cooperating with county governmental agencies in and out of the Northeastern Illinois Metropolitan area in order to obtain the local financing necessary to effectuate the program. These costs have been equitably prorated to the 40 quads. At present we do not anticipate any difficulty in obtaining the needed funds.

Potential Benefits

Flood hazard maps will depict in a graphic way, the areal limits of the hazard. This information would be valuable not only to property owners but also to insurance, mortgage and financial agencies, for it would enable them to more adequately assay the risk involved, thereby reducing the probability of prospective land-owners being victimized. Also, if suitable flood-plain regulations based upon these data are enacted by local governmental units, the following objectives would be achieved:

1. prevent encroachments upon floodway cross sections including bridges which would unduly increase upstream flood heights giving rise to greater overall flood damages.
2. prevent the location of structures in areas of overflow which if floated in time of flood would cause damage to downstream properties.
3. restrict land uses which would be hazardous to health and welfare.
4. restrict uses of flood-plain lands which would generate flood damages and would eventually lead to undue claims upon the public treasury for remedy.

The flood hazard maps will become public documents and will be readily available in quantity to all interested parties. A program of this nature represents preventive flood control. It cannot, however, mitigate any existing problems. In order to effectively cope with drainage problems and to avoid the creation of new ones, it is necessary to use to the fullest degree all possible adjustments capable of reducing flood losses. Flood hazard mapping represents one of many tools which can be employed to reduce the annual toll nature demands from those who willingly or unwittingly occupy our flood plains.

(More information on the flood mapping program is available from Northeastern Illinois Metropolitan Area Planning Commission, 72 West Adams St., Chicago 90, Ill.)

Mr. Sheaffer is Senior Planner for the Northeastern Illinois Metropolitan Area Planning Commission.

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New Mail Chute Combines Letter Drop, Cigarette Ejector, Lockstrap

A new mail chute and receiving box has been developed by The Pioneer Mail Chute Corporation (830 South Fulton St., Mount Vernon, N. Y.) which embodies an exclusive combination letter drop, lockstrap and cigarette ejector. Need for separate lockstrap is eliminated.

The "Americana chute meets contemporary architectural requirements in both design and function. Chute can be surface mounted, semi-recessed, or fully recessed. It has steel linings formed into one continuous section per floor and removable glass panels.

In announcing its new chute and receiving box the Pioneer organization emphasizes that the United States Post Office Department has extended full approval to the equipment.

Gas Analyzer Valuable Aid in Protection of Power Transformers

A device to analyze transformer gas to detect incipient faults was termed "a vital development" in the field of protection and maintenance.

The detector "for the first time makes available an effective and sensitive means for detecting low-energy incipient faults in power transformer having gas space above the insulating oil."

The need for a detector has been recognized for many years, and failures of some of the largest high voltage transformers in this country and Europe in the last few years "have caused growing concern," they reported.

Incipient faults in oil-immersed transformers cause local heating which decomposes solid insulation and oil with consequent production of some 16 different gases, analysis of which will indicate an incipient fault.

It has been reported that the gas detector provides for indication of incipient faults before they can develop into complete failures. Gas samples are taken without de-energizing or disturbing operation of the transformer in any way. . . . In all cases of early detection, damage to the transformer is minimized, the

power system is spared from unnecessary relayed outage, and continuity of service is further assured.

The portable detector utilizes the principle of a Wheatstone bridge in measuring the increases in the resistance of an accurately calibrated platinum alloy filament exposed to a gas mixture as compared with an identical filament in a sealed housing. A self-contained rechargeable battery and a charger furnish power for operation of the instrument.

(Summarized from report of panel discussion at last meeting of American Institute of Electrical Engineers.)

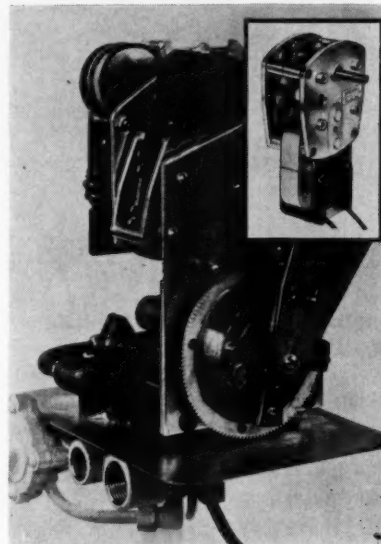
Aerobic digestion sewage treatment systems using the Hi-Cone Surface Aerator are detailed in a new bulletin. Heart of the eight-page catalog is a comprehensive selection guide which correlates oxygenation capacity and horsepower requirements of the two models most frequently used in sewage treatment plants for 50 homes and up, as well as municipal and medium-to-large commercial, institutional, and industrial installations. Request Bulletin No. 6650 from YEOMANS, 1999 N. Ruby Street, Melrose Park, Ill.

Manhole "Tub" Aids Access For Sub-Surface Repairs

A new lightweight, fiberglass manhole access "tub" offers man-hour savings in maintenance and repair of sub-surface water, sewer, power and telephone facilities. One man can install it easily (in either standard 26" or 30" openings) in flooded streets in up to 12 inches of water. Three off-center-type latching hooks anchor unit to manhole. An inflatable rubber tube prevents water from leaking around the perimeter.

127 DYER ROAD, SANTA ANA, CALIFORNIA

Motor Aids Control of Water Softener Cycles



New designs in small, low cost electric motors for appliances, pumps, vending machines and other motorized applications are highlighted in a new brochure issued by Brevet Products Corp., 601 W. 26th St., New York 1, N.Y.

Complete specification data are given for the new shaded-pole induction motors, and new models in helical, spur and worm gearmotors.

Small size, long life and high torque capability are among the reasons Model S Motor is used as an integral part of an ingenious "Electric Brain" in Great Lakes Corp.'s new "Electro-Magic" Water Softener. The motor accurately positions a 4-way valve which controls various operations during regeneration cycles. Backwash, brine feed, brine rinse and return-to-service functions are carried out for predetermined lengths of time, at prescribed rates of flow, for most efficient water purification and softening.

The "Brain," which is built around the motor, automatically starts and stops the cycles according to the location of control and tripper pins, which are set to provide maximum regeneration efficiency for particular water conditions.

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IS IT THE PROPER THING TO DO?

NOTE: This column deals with standards of conduct in the engineering field. The editor invites comments and criticisms on the ethical problems considered herein. Questions submitted on engineering ethics will be given careful attention. You should address your letter: The Editor, Midwest Engineer, 84 E. Randolph St., Chicago 1, Ill.

SITUATION: An individual who is neither a graduate engineer nor a licensed engineer is engaged by a client to design a project which comes within the definition of professional engineering under the Illinois Professional Engineering Act. After the preliminary report is made, the individual is found out and the Department of Registration and Education of the State of Illinois calls the individual in for a hearing. Between the time that the individual is "found out" and the time of the hearing, the individual organizes a corporation under the Illinois Structural Engineering Act and hires an engineer who is registered and a bona fide engineer to work for the corporation.

QUESTION: Is the engineer acting in an ethical manner in associating himself with the non-engineer?

REPLY: It is unethical for the licensed engineer to engage in subterfuge in assisting the unlicensed "engineer" to get out of difficulties with the law or the profession.*

SITUATION: Keep in mind the following Rule for background.

"An architect who has been retained as a professional adviser in a competition shall not accept employment as an architect for that project."

This problem involves the appointment adviser to study and prepare a program for an architectural competi-


tion for a public office building. He is paid for his particular service as a professional adviser.

A political subdivision does not proceed with the competition, but decides in the best interests of time to interview and hire an architect for the design of the structure considered initially as a competition. After interviewing several firms of architects, the selection is made of two firms—one of the firms associating, being represented by the original professional adviser.

QUESTION: In accepting the commission under this circumstance, is the architect violating the intent of the above rule?

REPLY: It is unethical for a paid adviser of a project to take advantage of information as a result of studies by competing architects to secure the prize for himself and that of his architectural firm.*

*An opinion of the Panel on Engineering Ethics of the Division on Education and Research of the Western Society of Engineers.



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A SUN POWERED DEVICE that provides emergency communication on expressways was demonstrated recently in Chicago. A development of Hoffman Electronics Corp. of Los Angeles, Calif., this device can be used to call police, fire, ambulance or mechanical aid. Any one of four push buttons sends the selected message to a central station and automatically records the location where help is needed.

With a call box at every half mile, motorists would never be stranded.

No external wires or power are required.

ROOFING STUDIES have been prompted by the large acreage of flat built-up roofing used on such buildings as shopping centers and schools. These roofs offer economy and ease of construction for large buildings, and they are often the only possible choice from the standpoint of appearance.

But in spite of their advantages, these flat surfaces take a beating from the weather. Solar intensity, rain, frost, ice, cyclical thermal expansion, and moisture penetration from below have resulted in many roof failures. Some of these failures involve thousands of dollars in damage and resulting law suits. In late 1959, the National Roofing Contractors Association turned to the University's Small Homes Council—Building Research Council for help with this urgent problem.

The two-year investigation, under the direction of Professor Donald E. Brotherson of the Department of Architecture, consists of literature surveys, field surveys of roof failures, and laboratory studies. Findings to date suggest that the roofing problem could be one of moisture transport from below, complicated by cyclical heat flow of unusually large magnitude. Professor J. R. Carroll of the Mechanical Engineering Department is serving as an engineering member of the seven-man Advisory Committee for the project.

University of Illinois Bulletin

CTA Speeds Projects to Aid Unemployment

Activating its recently announced program for speeding-up transit plant improvement to help reduce unemployment, Chicago Transit Board last month called for bids on seven projects involving an expenditure of an estimated \$4,748,600.

The Board also authorized Chairman V. E. Gunlock to retain consulting engineers to prepare plans, designs and contract specifications for five more projects costing an estimated \$3,110,000.

In addition, the Board also authorized Chairman Gunlock to purchase at a cost of \$376,689 a total of 424,350 square feet of property at Desplaines Avenue in Forest Park where CTA's terminal facilities of the Congress rapid transit route are under construction.

The property where the terminal is located was originally purchased by the Cook County Highway department in connection with construction of the Congress Expressway. CTA is now preparing to proceed with the construction of a \$969,900 terminal shop building, and permanent station facilities. A contract for the terminal shop is being awarded to the Mayfair Construction Company of Chicago, the low bidder.

CTA is proposing to pay the County what it paid for the land, \$346,876, plus the County's cost of acquisition, amounting to \$20,813.

The projects on which the taking of bids was authorized are:

New bus overhaul shop at 77th and Vincennes where CTA is now consolidating its surface shops, having abandoned its West shops at 3901 West End Avenue, estimated cost, \$4,150,000.

Construction of a degreasing room at Skokie rapid transit shops where equipment parts would be cleaned preliminary to repair work, estimated cost, \$95,000.

Connection of the Lake Street "L" with the Chicago and North Western elevated railroad right-of-way near Laramie Avenue, an integral part of the \$4,000,000 joint public agency project of elevating the ground-level section of the rapid transit route; bids to be opened March 9, estimated cost, \$250,000.

Installation of rapid transit car hoists at the Skokie shops and at the 63rd Street shops, estimated cost, \$60,000.

Construction of building at 63rd

"Engineers in Community Service"



Speaker at March 1 Luncheon, H. P. Sedwick, left, and Raymond D. Maxson, 60-61 WSE president.

The luncheon meeting of March 1 was honored by having as its guest former WSE president and Washington Award recipient, Mr. H. P. Sedwick, Chairman, Executive Committee, Board of Trustees, Presbyterian-St. Luke's Hospital. His subject was "Engineers in Community Service." Mr. Sedwick discussed typical problems that today face all communities and Chicago in particular. He brought out the intricate nature of these problems, the vast number of people involved and the size of projects to be undertaken. His remarks on the

merging St. Luke's Hospital with Presbyterian gave an insight into what such vast civic projects involve. He emphasized the urgent need for the services of men qualified by professional, engineering and administrative ability to aid in organizing and directing a wide range of activities in civic betterment. In recommending that engineers offer their services in such endeavor he stressed the many rewarding aspects of such effort in the light of his own experience over the recent past.

Street and Princeton Avenue to house a new substation to replace substation at 63rd Street and Wentworth to be dismantled to make way for construction of the South Expressway, estimated cost, \$100,000.

Removal of the remaining section of the old Garfield Park rapid transit structure, between the east side of N. Wacker Drive and the west side of Desplaines Avenue, estimated cost, \$90,000.

Removal of the remaining two blocks of the old Humboldt "L" structure from near Milwaukee and North Avenues to a point just east of Western Avenue, estimated cost, \$3,600.

Consulting engineering firms retained, and the estimated construction costs of the projects to which they are being assigned are:

De Leuw, Cather & Co., Chicago, assigned to preparation of plans and specifications for the \$1,500,000 new bus overhaul shop and transportation building at South Shops, 77th Street and Vincennes Avenue.

Skagberg-Olson Co., of Chicago, assigned to preparation of plans and specifications for the proposed new

terminal shops west of Harlem Avenue for the Lake Street rapid transit route, \$900,000.

De Leuw, Cather & Co., assigned to preparation of plans and specifications for remodeling existing car house at South Shops, 77th Street and Vincennes Avenue, estimated construction cost, \$500,000.

Consoer, Townsend and Associates, Chicago, assigned to preparation of plans and specifications for new transportation department offices at Howard Street and at Forest Park rapid transit terminals, estimated construction cost, \$150,000.

Alfred Benesch and Associates, of Chicago, assigned to preparation of plans and specifications for installation of facilities for grinding rapid transit car wheels, estimated construction cost, \$60,000.

Award of a contract to the Westinghouse Electric Corporation for purchase of \$417,750 worth of electrical equipment for the replacement substation to be erected at 63rd Street and Princeton Avenue was also authorized by the Board.

ENGINEERING ETHICS PANEL COMMENDED FOR WORK

Since the season 1960-61 is drawing to a close, the Chairman of the Division on Education and Research recommends the publication of the following item:

AN APPRECIATION

The Division on Education and Research of the Western Society of Engineers, gratefully acknowledges the loyal and unselfish work of the Panel on Engineering Ethics for its careful consideration and preparation of the questions and answers published in *Midwest Engineer*, in the column "Is It The Proper Thing To Do?"

The Panel comprises of the following:

Mr. William J. Bachman, President Chicago Chapter, American Institute of Architects, 5116 Hohman Street, Hammond, Indiana.

Mr. George T. Jacobi, Assistant Director of Research, Electronic Division, Armour Research Foundation, 10 West 35th Street, Chicago 16, Illinois.

Professor Edward F. Obert, Department of Mechanical Engineering, University of Wisconsin, Madison, Wisconsin.

Mr. James Zumner, Attorney, Stone, Nierman, Burmeister & Zumner, 134 South La Salle Street, Chicago, Illinois.

The following are some of the problems on Engineering Ethics that have been dealt with:

(a) The difference between cannons of ethics for engineers and rules of professional conduct for engineers,

(b) Whether an engineering society

can impose its will on members of the society to abide by the ethical rules as adopted by the society,

(c) Whether an unlicensed contractor can be his own professional engineer,

(d) Questions regarding fees for engineering service and Relations between employers and employed professional engineers.

Signed

Committee on Education & Research Division

E. H. Schulz, Vice President, Armour Research Foundation, 10 West 35th Street, Chicago, Illinois. Chairman.

Harold J. Holmquest, Partner, Carter & Holmquest Technical Services, 826 North Elmwood Avenue, Oak Park, Illinois.

William L. Everitt, Dean, College of Engineering, University of Illinois, C. E. Hall, Room 106, Urbana, Illinois.

L. T. Wyly, Prof. C. E., Research, Prof. Northwestern University, Evanston, Illinois.

Clarence H. R. Zacher, Chairman of Department of Drafting & Mechanical Technology, Purdue University, Calumet Center, Hammond, Ind.

Stainless Hopper Car

A new stainless steel covered-hopper car, designed for economical, "kitchen clean" shipment of bulk materials, will soon go into service on the nation's railroad network, United States Steel Corporation has announced.

A recently developed stainless steel, trademarked USS Tenelon, is said to be the key to the new car's economy and versatility. Because it has almost twice the design strength of conventional stainless steels, it was possible to use lighter gauge sheets of Tenelon steel to fabricate the car's hoppers, cover, and all other

interior parts that come in direct contact with the lading.

U. S. Steel says the new car is about 16 per cent lighter, yet equal in strength to conventional covered-hopper cars made from structural carbon steel, high-carbon steel, or even other grades of stainless steel. Standing empty, it weighs 58,500 pounds. By contrast, a conventional steel covered-hopper car of the same size would weigh about 70,000 pounds.

Car was built by Pullman-Standard—Division of the Pullman Company at Butler, Pa. plants.

Applications

Raymond M. Urbans, Senior Plant Engr., Western Electric Co., Inc., Hawthorne Station.

Roy W. Hovinen, Account Manager, Illinois Bell Telephone Co., 65 E. South Water St.

Leonard J. Stone, Manager, Systems Plan'g., ITT-Kellogg, 500 N. Pulaski Rd.

Philip G. Eckert, Chief Engineer, Illinois Bell Telephone Co., 212 W. Washington St.

L. W. Strandquist, Dist. Marketing Mgr., Illinois Bell Telephone Co., 65 E. South Water St.

Roland A. Peters, Executive Vice Pres., Leonard Construction Co., 37 S. Wabash Av.

Willard N. Nopper, 1936 Sheridan Rd., Evanston, Ill.,—attending Northwestern University

Garland Young Smith, Engrg. & Mfg. Mgr., Fred H. Schaub Engineering Co., 5300 Belmont Rd., Downers Grove, Ill.

Reed S. Robertson, Group Leader, Nalco Chemical Co., 6216 W. 66th Pl.

John R. Delk, District Manager, Daystrom Systems, 4455 Miramar Rd., LaJolla, Calif.

Use of Oxy-gas Lances

Details of Ford's open-hearth practice using oxygen-fuel lances to produce over 100 tons of steel per hour were given at the 44th National Open Hearth

ASPLUNDH

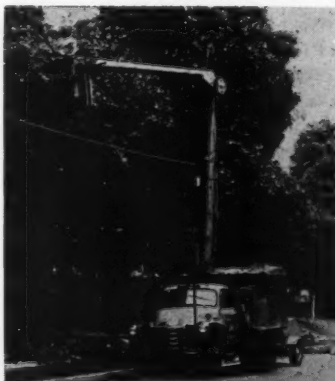
Effective and Economical LINE CLEARANCE and Right-of-Way work

Opening of new rights-of-way, and trimming of trees and chemical brush control on existing rights-of-way are operations which should be entrusted only to specialists.

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Wheeling, Illinois

Attention, Mr. Earl Reynolds



Steel Conference in Philadelphia, April 10-12. The conference was sponsored by The Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

G. A. Ferris, Operations Manager, Steel Operations, described experimental heat made at Ford's Rouge plant in which 427.5 tons of steel were made in a charge-to-tap time of 4 hours and 4

minutes. Operating rate for the heat was 105.1 tons per hour. Ford's practice consisted of using oxygen-fuel roof lances to help melt down the scrap as rapidly as possible. Hot metal was added less than one hour after starting to charge, and then oxygen at 45,000 cu. ft. per hour was fed through each of four roof lances to refine the heat rapidly.

Mr. Ferris said he believes that the

open hearth potentially can produce steel much faster than at present. "We feel that multiple oxy-gas lances introduced through the roof offer a new and more efficient firing method of the open hearth furnace," he said. "As development of the lance progresses, we feel it offers the best opportunity to take full advantage of raw material prices with a minimum effect on heat time."

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Pipelining in Our Own Backyard*

Some time ago, Northern Illinois Gas Company decided that large volume storage of natural gas, available in summer, was the way to meet its winter house heat load demand. Such storage in underground water-bearing sands (called "aquifers") was developed at Troy Grove, Illinois, some eight miles north of LaSalle. This bit of geology is not in the heart of our market area, the Chicago suburbs. As a consequence, a cross-country pipeline was constructed through our "backyard" to the vicinity of LaGrange during the summer of 1960.



Recently completed \$9 million 30 in. pipeline brings natural gas from "aquifer" storage near Troy Grove, Ill.—a distance of 73 miles—to point near La Grange, to serve west suburban area of Chicago

This line consists of 73 miles of 30" outside diameter pipe made to a minimum yield strength of 52,000 psi. This

strength pipe has been the most popular for large diameter pipelines laid in the last ten years.

Selection of route, engineering and construction followed classic pipeline patterns using helicopter, consultant and contractor respectively.

Historic Site

The route selected was generally northeast from Wild Bill Hickok's birthplace (Troy Grove) across farmlands to the vicinity of North Aurora, Illinois, on easements. From North Aurora eastward to the vicinity of LaGrange, the pipeline lays for the most part on a NI-Gas-owned strip of land five rods wide lying generally alongside the East-West Tollway.

Engineering and inspection of construction was done by a consulting firm who used 38 engineers, surveyors and field inspectors locally. Construction was by a local pipeline contractor whose field forces topped 350 installing over two miles of pipeline on a good day.

11 Railroads—72 Highways 28 Rivers, Streams Crossed

Eleven railroads and 72 highways were crossed by augering and placing 1¾ miles of casing pipe. Included were three crossings of the East-West Tollway itself. Twenty-eight rivers, streams and swamps were crossed requiring 1,400 tons of concrete weights. The major river crossing was the Fox, which features a mechanically hewn trench through the rock of the banks and river bed. Eight mainline valves sectionalize the line and

three major stations were constructed with it. These stations, somewhat unique in design, feature a majority of piping underground.

Climaxing construction was a hydrostatic strength test requiring over 13 million gallons of water followed by a gas leakage test.

Cost is always of interest to stockholders and the like. This "backyard" pipeline came to something over \$9 million of which over \$5 million was for material.

**From a talk delivered to the West Suburban Division of the Western Society of Engineers, February 8, 1961, by George M. Long, Supervising Engineer, Northern Illinois Gas Company. The original talk featured a film of the construction and slides.*

Data on Controls For Automated Tool

A new bulletin (No. 343), describes Sciakydyne Zero-Error Motor Control. It is used where regulated speed and exact positioning are required, such as — missile guidance, numerically controlled machine tools, automatic fusion welding equipment, general automation, material processing and manipulators. The control turns a dc motor into an outstanding, accurately controlled servomechanism, and provides a direct link between a dc power source and a dc motor. It is within the feed-back family of servo systems.

For copies write Sciaky Bros., Inc., Dept. L-30, 4915 W. 67th St., Chicago 38, Ill.

Automated Steel Mill Described in Reprint

"The Automatic Stockhouse," a paper delivered by John F. Meissner to the Association of Iron and Steel Engineers, has been reprinted from the Association's publication, Iron and Steel Engineer, and is available upon request.

Meissner, chairman of the board of Meissner Engineers, Inc., 300 West Washington Blvd., Chicago 6, Illinois, is a recognized authority in the materials handling field. In his paper he outlines an automated steel mill system, whereby raw materials are received, stored, recovered and moved to sintering plant or blast furnace, all automatically, and describes the supplying of furnaces with programmed charges of automatically prepared and beneficiated materials.

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Reviews of Technical Books



Theory of Metal Cutting

Theory of Metal Cutting. By Paul H. Black. McGraw-Hill Book Company, Inc., New York 36, N. Y. Pages, 204. Price, \$7.50.

This book is a scientific analysis of the metal cutting operation. It collects and interprets the theories and conclusions concerning what happens at and near the point of a cutting tool. The principles are explained in a manner compatible with simple, fundamental theories, but avoids the complications of a more rigorous treatment which would sacrifice the clarity of the metal cutting picture.

Although metal cutting is complex, a step-by-step consideration of the elements of the process reveals a reasonable and instructive picture which supplies quantitative information shedding considerable light on metal cutting specifications. The treatment is fundamental and is directed toward presenting an understanding of the process. This should be direct help in specifying machining operations and schedules to increase production rates of parts made of common materials, and of materials that are still in the developmental stage.

The text is directed towards practical design applications rather than acquaints the engineer with the design of machine elements and the design and selection of units of power transmission. Included are characteristics of strength, rigidity, wear and economy of manufacture and operation.

W.L.R.

Industrial Building

Industrial Building, Volume 1—Proceedings of the first Industrial Building Congress, held last December. Published by Clapp & Poliak, Inc., 341 Madison Ave., New York, N. Y. Cloth bound—232 pages. Price \$10.00 postpaid.

The volume contains the texts of the 38 papers presented at the sessions. It contains some of the most authoritative literature ever published in the field of

industrial building. "It is noteworthy that until the advent of the Industrial Building Exposition & Congress, industrial building was without a medium of information devoted solely to it," the foreword points out. "Considering the magnitude of the field and its complexities, the exposition and congress seemed destined to fill a considerable need. That they did so brilliantly is testified to this volume."

Topics covered are "Determining the Best Facility for a Company's Needs," "Some Critical Financial Questions," "Modernization vs. a New Plant," "Picking a Location Best Suited to Your Needs," "New Dimensions in Plant Design," "Working with Community Officials," "Employee Services," "The Use of Prefabricated Components," "Advances in the Use of Concrete," "New Developments in Application of Plastics to Industrial Construction," "Methods of Designing Flexibility into Your Plant," "How a Small Company Built Two Plants," "How a Large Company Built a Small Plant," "Modernizing a 75-Year-Old Building," "Controlling Costs During Construction," "Handling Construction Problems in Foreign Countries," "How and When Should Companies Handle Their Own Construction," "Developments in the Use of Structural Steel" and "New Applications of Aluminum in Industrial Construction."

The book will be published annually after each congress. The next congress and exposition take place in New York in September.

J.L.W.

Guide for Castings Users

Engineered Castings by Glenn J. Cook, Manager-Marketing, Foundry Department, General Electric Company. 240 pages, 6 x 9, McGraw-Hill, 327 W. 41st St., New York, N.Y., \$8.50.

A comprehensive guide for the user and buyer of castings, "Engineered Castings" is a source of broad knowledge for the design engineer as well as a reference

book for foundry personnel having duties in marketing, manufacturing, and engineering. The book—in which primary emphasis is given to casting use, rather than casting production—provides the reader with a broad understanding of and appreciation for metal castings as engineering materials.

Among the topics covered are sand molding, shell molding, investment casting, die castings, inspection and testing, vacuum casting, materials, casting designs and tolerance, and foundry selection.

The book has a number of special features: never before were such comprehensive instructions for buying castings available in book form (while other foundry books emphasized one metal or process, "Engineering Castings" covers all modern metals and processes); unique marketing data are presented, representing the combined findings of large and small organizations; the profitable design techniques presented will help the reader save money; all recent technical advances are described in detail. There are also review questions for each chapter, an extensive bibliography on specialized foundry topics and many helpful tables of physical properties, tolerances and specific do's and don'ts of casting design.

Glenn J. Cook is Manager-Marketing of the Foundry Department of General Electric Company.

Principles of Public Utility Rates

Principles of Public Utility Rates by James C. Bonbright (Columbia University Press, New York, N. Y., 433 pages, \$10).

Public utilities are under a legal sanction to supply satisfactory service at "reasonable" and not "unduly discriminatory" rates. A utility consultant and Columbia University economics professor, Dr. Bonbright goes into rate-determination principles and regulatory techniques.

INDEX NUMBERS

— Tools for Modern Management

By A. F. Birmingham

The need for indexing and the problems that make their applications so vital today were forcefully explained in the talk given by A. F. Birmingham before members and guests at the Feb. 8th Luncheon Meeting of WSE*. Mr. Birmingham is Staff Supervisor, American Telephone & Telegraph Co., Springfield, Ill.

We will not attempt to present here Mr. Birmingham's detailed discussion of typical examples of index construction and procedure or reproduce all of the

many graphs that were used to illustrate his remarks. Rather we summarize here that portion of his talk that so interestingly traces the changing conditions, current trends and future needs that make indexing of such vital concern to business and industry. (A booklet entitled "Index Anthology" containing the substantial text—plus illustrations—of Mr. Birmingham's talk has been published by American Telephone & Telegraph Co., Springfield, Ill.

Request copies are available.

What is an Index? Webster lists ten definitions of this word. Some of these are: 1. An indicator used to point out something—an Index Finger. 2. That which discloses or gives an indication—a preface or prologue. 3. A table or list arranged in alphabetical or numerical sequence. Reference Table in a textbook. 4. A formula expressing the ratio of one dimension of a thing to another dimension of that same thing—cost of Living Index, Index of Industrial Production. 5. A ratio or other number derived from a series of observations and used as an indicator of a certain condition. "Par" for a hole on the golf course is an example of this definition. "Par for the course" is, in this sense, an index for the game of golf.

This is the definition of indexing as applied to productivity and statistical quality control in American Industry and the one with which this work is concerned.

A Modern Tool

While much has been written about the need for, and subsequent development of, systems of indexing for industrial quality control purposes its use as an effective management tool is relatively new.

To better understand the need for such an index and the purpose it serves let us look for a moment at the role

management plays in American business and industry.

Almost every company operates in an environment which can be expressed graphically as shown in Figure 1.

A company is in business to furnish a service or manufacture a product and market the output at a profit. The company's output at any given time is usually a result of an actual or anticipated consumer demand, and can be represented by a point on the ordinate scale A-B.

Production of this product requires material and human effort. The total production cost as shown on the abscissa A-C.

The operating characteristic curve, B-C, is a function of the capitalized

composition or "built-in ability" of the company.

In a manufacturing business it consists of such semi-permanent items as the number and type of plants and equipment.

After careful market analysis, the initial objective of the company's top management team is to set up the fixed capitalized structure or "characteristic curve" in such a way that, in the anticipated market, the company will be operating on the linear or relatively "straight line" portion of its characteristic curve. Fluctuations in the market can then be reflected by corresponding additions or cutbacks in production expenditures on raw material, labor and distribution.

During periods of increasing product

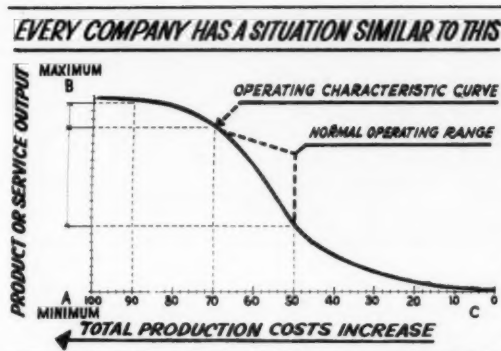
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Figure
I



demand a company that continues to increase raw material purchases and add people to the production and distribution organizations will realize the same proportionate return only as long as the company is operating on this linear portion of their characteristic curve.

Problems of Growth

If a company continues to grow it eventually reaches a point where additional production cannot be achieved on a straight line cost basis.

For example, adding a third production shift, 12 Midnight to 8:00 AM, in a plant already operating two full shifts usually will not result in a corresponding 33 per cent increase in product output on a comparable "cost per unit" basis. Machine maintenance must now be done on Saturday and Sunday at premium labor rates. As a plant approaches maximum productivity all equipment is being operated. Machine breakdowns become more expensive because of idle production employee costs during repair time. Quality control becomes more and more difficult. A business cannot operate very long at this point on their curve.

A company whose growth has been steady, has a different situation upon reaching this position. They must analyze their product potential, and, if they plan to continue to expand they must add new capital, i.e., plants, machines, vehicles, etc.; thus changing their characteristic curve.

Thus the task of management can perhaps be summed up: know at all times where we are operating on this curve, and plan and execute the immediate and long range goals of the company accordingly.

Since the goals of industrial management evolve mainly from the desire to

meet the supply needs of a consuming public, an examination of the forecasted needs of a country will often reflect the goals of the many businesses operating within its borders.

An examination of our national needs indicated that in the next fifteen years, in addition to our national defense requirements, we must have a vast increase in highways, water supply, homes, oil, power, etc.

In other words, if we continue our present performance in these areas we

are simply not going to get the job done.

To improve our standard of living we must accomplish the same amount of work with eight people in six days, making production costs cheaper, thus offering our product to people who heretofore could not afford it. This is progress.

When given a set of average quality instructions and tools and an average grade of raw material each of us would, with average effort, produce a product of fairly good quality in an average time. This can be considered "standard performance."

Assuming we have this standard performance, there are only two practical ways to increase the productivity of an individual on any job:

1. Improve the work methods.
2. Improve the tools used to do the work.

While these task-oriented reports are essential for long range planning and forecasting, shortcomings limit the usefulness of these reports as operating management tools.

(Continued on page 24)

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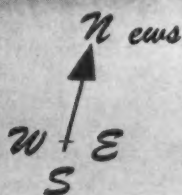
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Metropolitan Chicago architects, builders and building owners were honored April 13th, for their outstanding contributions to the area's architecture and construction at the 1961 Honor Awards Program.

More than 500 persons participated in ceremonies which paid tribute to those chosen for the architectural awards. The yearly event is sponsored by the Chicago Association of Commerce and Industry and the Chicago Chapter, American Institute of Architects.

Seven buildings selected by a blue ribbon jury of prominent architectural and business leaders were cited as outstanding examples of Chicago area architectural design, craftsmanship and construction.

Named for the top Honor Award this year was the Harris Trust and Savings Bank. A bronze plaque was presented to Stanley G. Harris, Sr., Chairman of the Board, Harris Trust and Savings Bank.

The bank building was designed by **Skidmore, Owings and Merrill** Architects and built by Turner Construction Company.

Six buildings received Citations for Excellence in their various categories.

James E. Rutherford, President of the Chicago Association of Commerce and Industry and Vice President in Charge of Mid-America Operations of the Prudential Insurance Company, presided at the meeting. The presentation of awards was made by William J. Bachman, President of the Chicago Chapter, American Institute of Architects and John R. Fugard, Jr., Chairman of the Honor Awards Committee.

Morton Bodfish, Chairman of the Board, First Federal Savings and Loan Association of Chicago, addressed the meeting.

Members of the 1961 Jury were: Winston Elting, Fellow, American Institute of Architects and President of Elting, Deknatel and Associates, Inc.; George

Danforth, A.I.A., Director, Department of Architecture and City Planning, Illinois Institute of Technology; Carter Manny, A.I.A. of *Naess and Murphy*, Architects. They were assisted in the judging by two representatives of the Chicago Association of Commerce and Industry: E. E. Hargrave, Administrative Vice President, Jewel Tea Company and Myron Fox, Chairman of the Board, Bell Savings and Loan Association. Coordinator of this year's Honor Awards Program was John Fugard, Jr., Past President of the Chicago Chapter, American Institute of Architects.

In addition to the top honor award, six other buildings received citations for excellence in their various categories: Lodge, Illinois Beach State Park, Ill., Architect, Barancik & Conte; Builder, George Cassidy Sons Co.; Chicago Seven-Up Office Building, Architect, *Naess & Murphy*; Builder, Robert G. Regan Co., Inc., Joseph T. Ryerson Co. Office Building, **Skidmore, Owings & Merrill**; Builder, Sumner Sollitt Co.; Signode Research-Engineering Building, Glenview, Architect, Hausner & Macsai; Builder, B. W. Handler Construction Co.; Residence, 303 Sheridan Road, Kenilworth, Ill., Architect, George Fred & Wm. Keck, Builder, R. C. Wieboldt; Bryan Junior High School, Elmhurst, Ill., Architect, Cone & Dornbusch; Builder, M. A. Lombard & Sons Co.

Gordon M. Yocum, Assistant to the General Manager of Wheeling Steel Corp. Steubenville, Ohio, works, has been named by The Metallurgical Society of the American Institute of Mining, Metallurgical, and Petroleum Engineers as the 1961 recipient of the AIME Acid Converter and Basic Oxygen Steel Committee Award.

Long experienced in the many phases of steelmaking processes, Mr. Yocum engaged for Wheeling in the use of oxygen in the open hearth and currently is

active in the technology of coal, coke, ore beneficiation, and iron and steelmaking processes for the company. He is best known for his development in 1937 of a workable dephosphorizing process for bessemer steel, which has been used successfully. Recently, he spearheaded the development of the steam oxygen bessemer process.

Edward S. Fraser, vice president in charge of manufacturing of Chicago Bridge and Iron company, and George E. Borst, vice president in charge of the eastern sales region, were elected directors of the company.

The Illinois Associates of Professional Engineers has elected James Flood, member of the engineering firm of Walter H. Flood and Associates, as president.

Carter H. Manny, *Naess & Murphy* project supervisor at O'Hare International Airport, was the guest on the City Desk program, Sunday April 23rd. With Len O'Connor, NBC newsmen, Jim Hurlbut, WNBQ moderator, and John Madigan, Chicago American, guest reporter, he reviewed the progress and problems of the many operations now underway at O'Hare. Some of the construction mentioned during the program included the Post Office, new restaurant, telephone exchange, Rent-A-Car and other buildings, as well as the parking lot areas. Of interest is the fact that the recently completed runway is said to be the longest of any commercial runway now in service.

J. Stewart Stein, former partner of Walter H. Sobel—J. Stewart Stein has announced the firm of J. Stewart Stein. Mr. Stein continues his practice of architecture and engineering at his present offices—1011 West Grand Ave., Franklin Park, Ill.

A team from the **Paul Weir Company, Inc.**, consulting mining engineers with principal offices in Chicago, recently arrived in Turkey to assist the Turkish government in its coal mining operation at Zonguldak. The team's mission is to assist in developing the mines, mine plants, and surface and underground operations to produce and then sustain production at an initial annual level of 7,000,000 tons of raw coal. Zonguldak, 300 miles east of Istanbul, is the site of Turkey's leading source of coking coal.

Harold B. Wickey, former operations Vice President, Glen Alden Coal Co., is chief of party. The team also includes Dan T. Fernandez, electrical engineer; Wilnot C. Jones, Jr., mechanical engineer, and A. E. Stuhlfire, accountant-office manager. They were accompanied by John E. Good, a Paul Weir Company Vice President, who will serve as consultant in the early months of the project's current phase.

The Paul Weir Company was retained for a three-year period by *Turkiye Korumur Isletmeleri*, a government agency. The project is financed by the U. S. Development Loan Fund.

Col. J. B. W. Corey Jr., 51 Williamsburg rd., Skokie, has been elected president of the Chicago post of the Society of American Military Engineers. He is commander of the Chicago engineer procurement office, army corps of engineers, 226 Jackson blvd. Col. Corey succeeds Col. John T. O'Neill, Fort Sheridan, as society president. The latter will serve on its board of directors.

Ralph C. Read has been named president of Cenco Instruments Corp.

Read, an industrial engineer, joined Cenco in 1956 as manager of manufacturing and became executive vice president in 1959.

As president he succeeds Alfred A. Strelsin, who became chairman earlier this month. Strelsin is also chief executive.

Read was also elected a director of the company to succeed William F. Crawford, who resigned because of the pressure of his own business.

William E. Haskell has been named general superintendent of U. S. Steel

Corporation's South Works in Chicago. He has been assistant general superintendent since December, 1955. He succeeds Charles J. Hunter, who becomes chief metallurgical engineer of operations—steel—at Pittsburgh. Howard A. Parker succeeds Haskell as assistant general superintendent.

Problems confronting industry in the field of standardization and its application will be discussed at the 15th annual spring meeting of the Company Member Conference of the American Standards Association June 1-2 in Chicago at Pick-Congress Hotel.

Topics of discussion during the initial conference day will include "Compressed Gas Cylinder Connections and the Grace of God" by Allen L. Cobb, director of industrial safety of the Eastman Kodak Company, Rochester; "Underwriters' Laboratories, Inc. Safety Standards in Action—Testing, Design and Enforcement" by D. L. Breting, superintendent of label service of Underwriters' Laboratories, C. A. Mattingly, staff specialist of Warwick Manufacturing Corporation of Chicago, and W. P. Hogan, Jr., chief of the electrical inspection bureau of the City of Chicago; a workshop on "Evaluation of a Standards Program" with an introduction by George F. Habach, vice-president of administration of the Worthington Corporation, Harrison, N.J.; and "Standards for Communication" by Joe W. Coffman, president of the Tecnifax Corporation, Holyoke, Mass.

The program for June 2 consists of three addresses and afternoon field trips to Underwriters' Laboratories and the International Harvester Co.

Thomas B. O'Connor, CTA's general superintendent of transportation and equipment maintenance, has assumed the supervisory responsibilities of Eldon A. Imhoff, general superintendent of personnel. Mr. Imhoff has retired after 42 years of transit service, according to Walter J. McCarter, CTA general manager.

In addition to his present duties, Mr. O'Connor, in his new capacity, will be in charge of the Training and Accident Prevention, Insurance and Employee Benefits, Medical, Employment, Job Classification and Central Records, Per-

sonnel Services and Employees' Suggestion System Departments.

Mr. O'Connor, a graduate in electrical engineering from the Armour Institute of Technology, started as a student engineer with the former Chicago Surface Lines on January 14, 1936. He subsequently served as a motorman, supervisor, clerk and in the Shop Department, and from 1937 to 1942 as an engineer in the Transportation Department.

He was advanced to assistant superintendent of transportation for the surface lines system in 1944. In 1951, he was named superintendent of transportation for both surface and rapid transit operations, and in 1953 he became, in addition, superintendent of equipment maintenance for CTA.

Mr. O'Connor is a member of the Western Society of Engineers and of Eta Kappa Nu, honorary electrical engineering fraternity.

The 10th Annual Hydraulics Conference, sponsored by the Hydraulics Division of the American Society of Civil Engineers, will be held August 16-18, in Urbana, Illinois. The co-hosts are the University of Illinois and the Central Illinois Section of the American Society of Civil Engineers.

The six half-day technical sessions will be held on the University campus in an air-conditioned auditorium. Those attending the conference will be housed in a recently completed dormitory.

The technical sessions will feature papers by nationally known experts in the fields of Ground Water Hydrology, Surface Water Hydrology, Hydrometeorology and Flood Control, Hydraulic Structures, Sedimentation, and Hydro-mechanics.

Mr. William H. Wisely, Executive Secretary of the American Society of Civil Engineers, will speak on "Society Affairs" at the August 16 conference luncheon.

Mr. Floyd E. Dominy, Commissioner of Reclamation, Bureau of Reclamation, U. S. Department of Interior, will speak at the August 17 evening banquet on a subject of timely interest to hydraulic engineers and their wives.

Additional information may be obtained by writing to Professor James M. Robertson, 125 Talbot Laboratory, University of Illinois, Urbana, Illinois.

John H. D. Blanke, Technical Editor, International Operating Engineer, Barrington, Ill., has been elected president of the Village of Barrington for a four year term. He is completing 26 years of service as a village trustee and recently has been chairman of the water and sewage committee.

Paul J. Graham, manager of the rapid transit department of Union Switch and Signal division of Westinghouse Air Brake company, spoke April 19th at a meeting of the American Transit association in the Conrad Hilton hotel.

Russell F. Gotha, chief engineer of the Chicago die casting plant of Stewart-Warner corporation, was appointed manager of the Bridgeport, Conn., plant of the Stewart die casting division.

Hans Hasen, Harza Engineering Co., is now serving the second half of his four-year term as a La Grange Park trustee. Having completed his assignment as water department trustee he has now been named trustee of the public works department with the election of a new president.

INDEX NUMBERS

(Continued from page 21)

It is difficult to evaluate real merit in these reports without considerable time consuming analysis. In this regard we recall the story about the fisherman who, when asked for the average number of fish he caught per day replied, "There ain't no average—it varies."

There is sufficient evidence to support the theory that many people who come into management positions "from the ranks" have a tendency to evaluate these task-oriented reports in terms of the "Good old days," or "How it used to be done." New processes, equipment, material and techniques become available, and should automatically change the standards of achievement as they are applied. This is the real danger zone for the Plant Operating Manager or Supervisor. Unless careful, many managers can get "lost in the trees" here and have difficulty "seeing the forest." This is perhaps the most practical reason for converting these task-oriented reports to an index table; some mathematically and psychologically sound numerical "figure

Size Control Co., a Division of American Gage and Machine Co., Chicago, announces the following appointments: Peter J. Sommer has been appointed vice-president and General Manager; Thomas J. Owen, the position of vice-president of manufacturing; and Frank J. Vlasaty, the sales manager. Mr. Sommer is an original member of Size Control Co. and was Superintendent of the plain gage department for 19 years; Mr. Owen has been with Size Control Co. for 17 years and for the last 16 years has supervised the thread gage department; and Mr. Vlasaty was formerly Director of Research Engineering of Size Control Co. in which he directed the activities of the company in regard to special gages and missile work. Mr. Ernest E. Olds has taken over the Florida territory.

Bagpipe Music Feature Of Mar. 28th Program

The March 28th General Meeting presented a program of unusual variety and interest. The dinner feature was a talk and demonstration on the operation and playing of the Bagpipe by Mr. Melville

or merit" between zero and 100 for use by line management in spotting areas of deficiency.

Restated, the objective of an operating index might well be: Keep busy management people available for the long range planning and goal establishing assignments in a company. Help them set their sights primarily on achieving these goals, using the rate of progress as the basis of the need for new methods and tools to do the job.

BUILDINGS IN BARRELS

At the United States Army Engineer Research and Development Laboratories, Fort Belvoir, Va., a study is being conducted which may solve one of the Army's logistic problems.

It contemplates the shipment of barrels of liquid plastic, content of each capable of being expanded to form a building 16 feet wide, 24 feet long, 9 feet high, weighing 552 pounds. Once at the construction site, the chemicals can be mixed to form a rigid building material of plastic form.

The experimental building is a panel type, each panel being formed in place in molds somewhat similar to a metal casting.

One way to reinforce it is to spray with polyester or epoxy fiber-glass resin. If it proves practicable, the Army saves shipping space and money as the final building is low in cost.

Finlayson. Mr. Finlayson, who is a member of the Stockyards Kilty Band, favored the guests with a number of Bagpipe selections and appeared in full Highland dress.

The technical sessions offered: Angus J. Johnston, author of the book "Virginia Railroads in the Civil War." He discussed the difficulties encountered by the roads as the war progressed.

Herbert M. Sachs, Supervisor, Electronic Capability Section, Electronic Research Division, Armour Research Foundation, spoke on "Developments of Instrumentation for Monitoring High Altitude Interference Parameters."

Obituaries

WILLIAM J. BUCHANAN, a WSE member since 1956, died suddenly, on April 5th, in Jamaica, W. I. He had been on the staff of the Malaria Eradication Training Center at Kingston since February of 1960. Before succeeding to this position he had been in charge of the South Cook County Mosquito Abatement District in Chicago and had extensive experience in this field in other areas. Mr. Buchanan, who was 49, was born in Terre Haute, Ind. He received a BS degree from The Citadel in 1934.

Mr. Buchanan is survived by his wife, two minor children and a son in the Armed Services. Mrs. Buchanan and the children have returned to the United States to reside in Charleston, S. C. Mr. Buchanan's body was flown to Charleston for interment.

GEORGE A. QUINLAN, a WSE life member since 1949 died April 8th. He became a member of the Cook County Department of Highways about forty years ago and for many years held the position of Superintendent. Mr. Quinlan was 80. Born in Waco, Texas, he attended Georgetown University where he received an A. B. degree. He was a member of the American Society of Civil Engineers. He had been a WSE member since 1928.

VICTOR H. JULIAN died in Tucson, Arizona February 16th. He was with Commonwealth Edison Company for over thirty years and at the time of his retirement had served in various capacities, including positions in the Budget Bureau. Mr. Julian was 71.

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POSITIONS AVAILABLE

This page is published to implement the intent of the James H. Brace bequest.

C-8614 (A) ELECT. ENGR. BSEE age to 40; Knowl. of elect. & electronic components. 2 yrs. actual circuit design. Duties: Design & devel. of electronic circuits for new products. Conduction of lab. tests to evaluate electro-mech. & electro-hydraulic indust. control components for the process & heavy industries. sal. \$8/11,000 loc. Chgo., employer will pay the fee. Must be U.S. citizen.

C-8643 TECHNICAL EDITOR Grad. EE 2+ yrs. exper. in elect. utility design, operation or construction. To prepare tech. articles covering elect. end of utilities. To attend tech. meetings & prepare articles & news items sal. \$7/10,000 loc. Chgo., employer will pay the fee.

C-8630 RESEARCH & DEVEL. ENGR. Grad. EE age 25-40; Duties: Research & devel. on electronic circuits for control systems. Test systems & design production models for field evaluation. Should have 4+ yrs. exper. on electronic circuits, for a mfrg. of controls sal. \$8700/9600 loc. No. Chgo. Suburb, employer will pay the fee.

C-7736 PROFESSOR OF MECH. ENGRG. PhD or equiv. Duties: Teaching on undergrad. & grad. level & research in the general area of machine design. Areas of interest may incl. dynamics of mach'y., vibrations, bearings & lubrication, etc. sal. \$10/12,000 loc. Ill., employer will pay the fee.

C-8627 INDUSTRIAL ENGRS. Grad. ME or IE age to 43; 0-5 yrs. exper. in general indust. engrg. i.e. methods, time study, costs, etc. Working in the field on methods, time studies, cost reduction, etc. within a 40 mile radius of Chgo. for

a railroad, home every night, car req'd. Can use recent grad. & train. Must be U.S. citizen, sal. to \$12,000 dep. on exper. plus expenses for car & travel, loc. Chgo., employer will pay the fee.

C-8614 (B) DESIGN ENGR. BSME age to 45; Min. 4 yrs. actual board design exper. in mech. or hydraulic field. Capable of providing alternate solutions to a given problem. Must be able to carry out assignments with min. of supv. after reasonable indoctrination period. Must know machine shop practices, welding, materials & finished. Duties: Design of hydraulic-mech. controls. A large portion of time is spent at drawing board. Will supv. 2-4 draftsmen. Must be U.S. citizen, sal. \$8/11,000 loc. Chgo. employer will pay the fee.

C-8480 ADVERTISING ACCOUNT EXECUTIVE, PUBLIC RELATIONS BSEE., ChE, ME Plan & execute public relations programs for engrg.-oriented client firms, incl. writing gen'l. & tech. news releases, tech. papers, feature articles. Supv. press tours, customer house organs. Maintain active liaison with client mgmt. & engrs. & with tech. magazine editors, for a public relations agency sal. \$7500/15,000 loc. Chgo., employer will pay the fee.

C-8620 WELDING DEVEL. ENGRS. BS in Welding, Mech. or Met. Engrg. with 3-5 yrs. exper. in resp. position with a company doing plate fabrication or equiv. Able to make mech. drawings of machines & jigs & a working knowl. of

metallurgy desirable. Duties: Devel. of new methods of welding & fabrication, evaluate latest welding eqpt. & processes for possible use in shops & field operations & study methods of improving present shop & field operations & study methods of improving present shop & field welding processes. Should be able to design, fabricate & test this type of eqpt. sal. open, loc. Chgo., employer will negotiate the fee.

ENGINEERS AVAILABLE

ELECTRICAL ENGRG. OR SALES MGMT. BSEE 35; 8 yrs. engrg. supv., 3 yrs. district application & sales engrg. Comprehensive marketing & engrg. exper. in conjunction with heavy indust. elect. control systems. \$12/15,000 loc. Open MW-2170

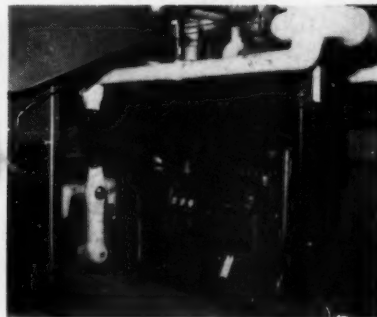
PROJECT ENGRG. BSME 50% Grad. Wk. to MSME age 40; 15 yrs. diversified exper. automatic mach'y. devel., package & bulk materials handling eqpt. design & devel., light struct. design, elect. control circuitry, plant layout, estimating & purchasing, research, also supv. \$12,000 loc. Chgo. Area pref. MW-2171

DIRECTOR OF ENGRG. BS + Grad. Work 43; 22 yrs. in engrg., plant, methods, tooling, processing, product design, automation & industrial engrg. Also sales promotion of engrg. services. \$15,000 min. loc. Chgo. Pref. MW-2173

DEVEL. ENGR. ME 39; 15 yrs. coordinated engrg. efforts of 30 men. Paper & metal container machine devel., conceptual design, tooling, estimate costs. Customer contact & proposal thru final delivery. \$12,000 min. MW-2174

Heat pump saves plant 13% on installation costs

(also heats and cools for less than any conventional fuel)



The problem:

Lyon Metal Products Inc. of Aurora, Ill., planned to add 5,000 square feet of office space to its plant and needed both heat and year-round air conditioning.

Especially important was a system that could be easily and economically expanded to heat the company's existing office space. These offices were being heated by steam that eventually would be needed for plant operations.

Also, one section of the new office area would contain heat-producing electronic office equipment, and this area would often require cooling when the rest of the space needed heat.

The solution:

A heat pump system to both heat and cool the new office space was designed by The Haried Company of Aurora, heat pump specialists.

The heat pump provides precisely controlled temperature conditions in all areas at all times. In fact, heat removed from the area full of electronic equipment is used by the "pump" to heat the other section—so, in effect, 88% of the air conditioning of the clerical section is free.

Lower operating costs

Installation of the heat pump system cost 13% less than any comparable heating and cooling systems. Operating costs of the heat pump in the Lyon Metal Products Inc. offices is also less than any other type of heating and cooling that could have been installed. In fact, engineers figured the fuel saving at 50%.

Additional important savings

Construction costs were also lower because of these heat pump advantages: There was no need to provide for a chimney. No space or facilities were needed for a boiler room. No space or equipment was needed for fuel storage. Also, there is nothing explosive on the premises. And there is a saving on insurance costs because there is no combustion in the building.



Commonwealth Edison

AND

Public Service Company

